REMARKS

Claims 1-4 and 6-10 are pending. There is only a single ground of rejection. The Examiner argued, in the last Office Action, that it would be obvious under 35 USC 103 to the skilled artisan to pick and choose various portions of four (4) cited references in order to arrive at the claimed invention. It is not obvious as explained below.

The Cited References

The four (4) cited references, in the approximate order in which they were referred to by the Examiner, are:

(1) US patent 6,048,404 (White)

(2) US patent 5,437,201 (Krueger)

(3) US patent 5,621,180 (Simon)

(4) US patent 5,863,789 (Komatsu).

The Examiner appears to apply White as the primary reference.

The Apparatus Claims

Apparatus Claim 10 is representative of the other apparatus claims. Claim 10 contains many structural limitations not found in White.

Assuming, for the sake of argument, that the White "Parr Bomb" (White, column 7, line 28) is subject matter within the scope of paragraph (A) of claim 10, White still does not disclose the claimed invention. Claim 10 recites:

> (B) means for feeding inert gas to the sample vessel in order to **displace any air** in the sample vessel and leave the sample vessel substantially completely full of inert gas at atmospheric pressure; [**emphasis** supplied]

White feeds nitrogen to the bomb (column 7, line 28), but is completely silent on displacing any air. The only practical way to displace air is to provide a second conduit to the bomb. White is silent on any hypothetical second conduit. The function of White's nitrogen is "to improve the transfer of heat"(column 7, line 28). The motivation to improve heat transfer would not lead the skilled artisan to displace air.

White fails to disclose or suggest the apparatus of pending claim 10 because White fails to disclose the claimed "means for feeding inert gas" of paragraph (B) of claim 10.

White fails to disclose the canister of paragraph (D) of claim 10. This is undisputed by the Examiner who states "White does not teach the use of an evacuated canister for collecting the sample." (Last Office action, page 3, line 4). The facts are that White fails to teach the use of any canister for any purpose. To set the record straight, claim 4 does not mention an "evacuated canister"; only a canister as defined by the claim.

White also fails to disclose a fluid conduit as required by paragraph (E) of claim 10. Clearly it is impossible for White to disclose the valve of paragraph (F) in the non-existent conduit (E).

The "whereby clause" of claim 10 requires "opening the valve". White does not even disclose a valve much less opening one. White is completely silent on the claimed "transfer of the volatile constituents from the solid sample to the canister" because White discloses neither transfer nor a canister.

The deficiencies of White are not met by the other three cited references. Neither Krueger, nor Simon, nor Komatsu disclose the combination of vessel, canister conduit, and valve as required by pending claim 10.

Even if it were obvious to combine the structures of Krueger, Simon, and Komatsu, with White's Parr Bomb, the resultant hypothetical structure would still not be subject matter within the scope of that claimed in claim 10. Many of the limitations present in claim 10 are also present in the other apparatus claims, all of which are patentable for the same reasons that claim 10 is patentable.

The Method Claims

Method claim 6 is representative of the other method claims. Claim 6 contains many limitations not found in White.

Claim 6 requires in step (III) "filling the sample vessel with inert gas to thereby displace any air". As discusses above such a filling is not disclosed by White.

Claim 6 requires in step (IV) "providing a canister, the interior of which is at sub-atmospheric pressure". White discloses no canister at all and certainly not one at sub-atmospheric pressure.

It is simply impossible for White to disclose, and in fact White does not disclose: "providing a fluid connection between the interior of the canister and the interior of the sample vessel" as required by claim 6 step (V).

The whereby clause of claim 6 reads:

> "whereby the pressure of the interior of the sample vessel is rapidly reduced; whereby the volatile constituents present in the solid are caused to leave the sample and are caused to leave the sample vessel and are caused to collect in the canister"

virtually none of which is disclosed by White.

The deficiencies of White are not met by the other three cited references. Neither Krueger, nor Simon, nor Komatsu disclose steps (II) through (V) in the order recited nor do any of them disclose the limitations in the whereby clause of claim 6.

The Krueger disclosure "relates to fluid sampling" (column 1, line 5). Fluids are gases and liquids not a "solid" as required by the preamble of claim 6. In fact the preferred samples of Krueger are gases. The title of Krueger is "NEGATIVE PRESSURE **GAS** SAMPLING DEVICE" [**emphasis** supplied].

Krueger does not disclose "filling the sample vessel with inert gas to thereby displace any air in the sample vessel" as required by step (III) of claim 6. In fact Krueger does not disclose any fluid communication between his "container 3" and his "vessel 9". The attention of the Examiner is invited to Krueger Figures 1, 3, and 4 as well as column 8, lines 8-33. The Krueger "vessel 9" appears to be a flexible bag which is **inside** the Krueger "container 3". No matter whether the Examiner equates the Krueger "vessel 9" with the claimed vessel or canister; and no matter whether the Examiner equates the Krueger "container 3" with the claimed vessel or canister; Krueger fails to disclose method steps (III), (IV) and (V).

The Examiner relies on Simon for disclosure of an evacuated sample vessel 62 (Simon Figure 3). There is no disclosure or motivation in either Simon or in White that would lead the

skilled artisan to take the Simon evacuated sample vessel 62 and combine it in any way with the White "Parr Bomb".

The Examiner argues that Komatsu discloses a "thermostatic chamber". Assuming without deciding that this is true, it is not relevant to the non-obviousness of the claimed invention. None of the pending claims employ the phrase "thermostatic chamber".

Even if it were obvious to combine the methods of Krueger, Simon, and Komatsu, with that of White, the resultant hypothetical method would still not be subject matter within the scope of that claimed in claim 6. Many of the limitations present in claim 6 are also present in the other method claims, all of which are patentable for the same reasons that claim 6 is patentable.

Four References Proves Non-obviousness

The use by the Examiner of four references is probative of non-obviousness. The very fact that the Examiner must pick and choose elements from each of four references proves that the claimed invention is not obvious. Hindsight is impermissible.

Technical Features of the Claimed Invention

(1) The invention in this application is characterized in that, by keeping a sample vessel containing a sample and filled with inert gas at a temperature at which the sample is not thermally decomposed, and connecting a canister depressurized in advance to the sample vessel, all the volatile constituents present in the sample are made to evaporate in a moment within the sample vessel and collected in the canister. Thus, all the volatile constituents present in the

sample, from those higher in volatility to those lower in volatility, are collected without changing their quantitative relation facilitating subsequent analysis by gas-chromatography.

(2) Meanwhile, in the headspace method shown in White, for example, within a sample vessel containing a sample and filled with inert gas, constituents evaporating from the sample and accumulating in the headspace are collected and subjected to analysis (statistic headspace method). In this case, the volatile constituents are made to evaporate until equilibrium between the evaporated (gas) constituents and the sample (gas-liquid equilibrium or gas-solid equilibrium) is established within the sample vessel.

In this case, constituents higher in volatility evaporate faster, and due to the pressure of those evaporated (gas) constituents, evaporation of constituents lower in volatility is hindered. Specifically, constituents higher in volatility evaporate from the sample faster and accumulate in the upper area of the sample vessel, and constituents lower in volatility evaporate and merge into the gas constituents accumulated in the upper area. Thus, the pressure of the gas constituents already accumulated in the upper area of the sample vessel not a little hinders the evaporation of constituents lower in volatility. Thus, even when equilibrium is established within the sample vessel, the relative proportions of the gas constituents accumulated in the upper area are not always equal to the relative proportions of the volatile constituents present in the sample.

Thus conventionally, in order to remove the effects of constituents higher in volatility, a sample is placed in an open vessel, and constituents evaporating from the sample are absorbed with an absorbent such as "Tenax" while supplying a carrier gas to the gas phase. Then, the constituents absorbed are desorbed from the absorbent and subjected to analysis (dynamic headspace method). However, affected by the absorbent used, conditions relating to desorption,

etc., the relative proportions of the volatile constituents desorbed from the absorbent can be different from the relative proportions of the volatile constituents in the normal state.

(3) As mentioned above, in the invention in this application, by keeping a sample contained in a sample vessel at a temperature at which the sample is not thermally decomposed, and connecting a canister depressurized in advance to the sample vessel, all the volatile constituents present in the sample are made to evaporate in a moment, regardless of differences in volatility, and collected in the canister. Thus, this invention does not have the above-mentioned problems inherent in the static headspace method and in the dynamic headspace method. This invention is favorable for analysis of constituents, since it can collect all the volatile constituents in a canister without changing their relative proportions and subject them to analysis.

As described above, the invention in this application is essentially different from the headspace method shown for example in White. Further, in White, there is nothing that suggests this invention. Hence, this invention is non-obvious and therefore patentable.

Summary

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to telephone David R. Murphy (Reg. No. 22,751) at 703-205-8000; Extension 8053 to conduct an interview in an effort to expedite prosecution of this case.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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